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AI Use Cases for the Enterprise

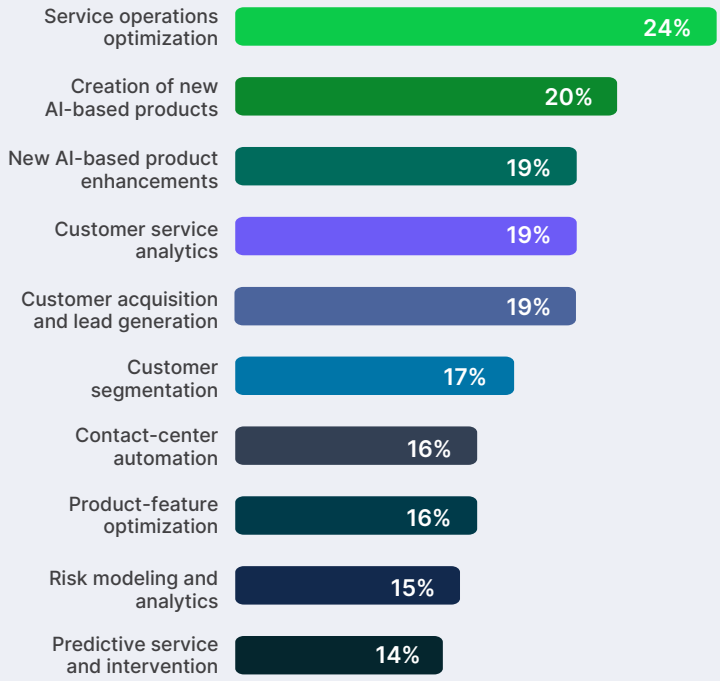
9 Industries Using AI to Accelerate, Disrupt, and Innovate

Artificial intelligence (AI) is all around us. It's in our intelligent home devices, healthcare diagnostic tools that scan our bodies, and cars we drive or pass on the street. AI has revolutionized the way we live, and it's doing the same where we work. Increasingly, organizations are adopting AI and using **AI platforms** and other technologies to develop, deploy, and maintain AI-powered products and services at enterprise scale.

According to a McKinsey survey **(The State of AI in 2022),** the rate of enterprise AI adoption has more than doubled since 2017, and organizations that generate the highest financial returns from AI pull ahead of their competitors.

However, to capture the business value of such AI use cases, organizations must navigate a dizzying array of tools and complex techniques. That's why many enterprise organizations are creating bespoke AI platforms using a combination of trusted providers and open-source technology. This approach allows them to leverage both the reliability and support of an enterprise AI platform, and the innovation and community of open-source tools.

McKinsey survey respondents apply AI to a variety of use cases, including:



How Various Industries Use AI to Innovate

McKinsey's research shows that organizations have doubled the average number of ways they use AI, up from 1.9 capabilities in 2018 to 3.8 in 2022. Among these, robotic process automation, computer vision, and natural language processing remain the most commonly deployed technologies, followed by chatbots and deep learning.

Based on Anaconda's decade of working with enterprise organizations applying AI to innovate products and services and optimize operations, here are 9 common AI use cases for the enterprise that we've observed:

Banking

Banks have been creating business value with AI for years now by transforming how customers interact with them, especially remotely. For some consumers, using mobile banking applications was among their first interactions with AI; banks use computer vision to detect check fraud in mobile check deposits, where the consumer takes a photograph of both sides of a check to deposit the funds into their account.

McKinsey research dated May 2021 estimates AI technologies for global banking could create up to USD $1 trillion of additional value each year, considering how AI can lower costs, reduce errors, and create new opportunities for banking organizations.

Common AI use cases in banking include:

Fraud detection: The most common application of machine learning is fraud detection. Fraud detection algorithms can be used to parse multiple data points from thousands of transaction records in seconds, such as cardholder identification data, where the card was issued, time the transaction took place, transaction location, and transaction amount.

To implement a fraud detection model, multiple accurately tagged instances of fraud should already exist in a data set to properly train the models. Once the model detects an anomaly among transaction data, a notification system can be programmed to alert fraud detection services the moment the model identifies a suspicious transaction.

Fraud detection is a type of anomaly detection algorithm. These algorithms can also be applied to data sets in other business areas to serve different purposes, such as network intrusion detection. This is one reason why some companies find more value in investing in an enterprise data science platform, rather than purchasing out-of-the-box models or pointed analytic solutions.

Credit scoring: Banks also rely on AI to establish accurate credit scoring. By implementing credit scoring algorithms, financial institutions do not have to rely on generic scores from reporting firms. Many lending institutions see a benefit in developing custom credit-scoring models that utilize their own customer activity data, rather than the aforementioned generic scores, to better predict the risk or opportunity of extending a new line of credit. In doing so, they can reduce delinquency costs that come from loan write-offs, delayed income from interest, and the servicing cost of trying to collect late payments. Customers can be re-evaluated in real time. Machine learning (predictive) algorithms are used to update these scores as new data rolls in, ensuring they are based on the most current information. They rely on data from past loans, granted there is enough data from both good and bad loans to train them effectively.

Credit risk analysis: These predictive algorithms can also be utilized at the macro level to assess risk and predict market movement. Financial institutions use credit risk analysis models to determine the probability of default of a potential borrower. The models provide information on the level of a borrower's credit risk at any particular time. If the lender fails to detect the credit risk in advance, it exposes them to the risk of default and loss of funds. Lenders rely on the validation provided by credit risk analysis models to make key lending decisions on whether or not to extend credit to the borrower and the credit to be charged.

Other common AI use cases in banking include:

- Account risk analysis
- Credit-line adjustment approvals
- Customer segmentation
- Personalized offers
- Strategic pricing models

Ecommerce

Amazon was among the first to introduce consumers to AI in ecommerce but it looked more like magic at that time, coming from a new, online seller of books. In 2003, Amazon's team of researchers issued a paper about their use of a **recommendation algorithm called collaborative filtering** to predict a customer's preferences, initially using other shoppers' preferences.

Amazon's AI team learned that analyzing purchase history at the product level yielded better recommendations than results at the customer level. This was groundbreaking work, and since then, ecommerce companies have expanded their use of AI significantly.

Common AI use cases in ecommerce include:

Product recommendations: Predictive analytics power advanced recommendation systems that analyze the historical purchases of website and app visitors to recommend more products. The models that run these systems are based on choices of similar users who use the same kinds of products or provide similar customer ratings.

Product-shipping models: Predictive analytics is also used in the form of an anticipatory shipping model. They predict purchase patterns by customer and ensure appropriate items are stocked in the nearest warehouse.

Price optimization: Ecommerce also uses AI for price optimization, providing discounts on popular items and earning profits on less popular ones. Fraud detection is another relevant area—using algorithms to detect fraud sellers or fraudulent purchases.

Other common AI use cases in ecommerce include:

- A/B testing
- Chatbots and virtual assistants
- Churn prediction
- Customer retargeting
- Demand forecasting
- Dynamic pricing
- Fraud detection
- Frontline worker enablement
- Image processing
- Personalization
- Routing optimization
- Sales process improvements
- Website search engines

Energy

Energy management organizations are applying AI at a growing rate; the **global market for AI in energy is projected to grow 21% from 2022 to 2030,** according to Research and Markets research published in August 2022. Energy AI use cases are growing along with global energy production and consumption, with organizations using AI to improve energy efficiency, grid stability, and smart energy solutions.

Common AI use cases in energy include:

Anomaly detection: Anomaly detection is the process of identifying data points or patterns that deviate significantly from the expected or normal behavior of a system. In the context of the energy industry, anomaly detection can be used to identify unusual or anomalous events in energy systems, such as power grid failures, equipment malfunctions, or unusual energy consumption patterns.

The benefits of using anomaly detection in the energy industry include the ability to detect and respond to potential problems before they become critical, reducing downtime and maintenance costs, and improving overall system reliability and efficiency. Anomaly detection can also help identify energy inefficiencies, enabling energy providers to optimize their systems and reduce energy waste.

Digital twins (simulations): Digital twins are virtual replicas or models of physical assets or systems, such as power plants or oil rigs, in a computer program. These digital twins can be used to simulate and test the behavior of the physical assets or systems under different operating conditions and scenarios.

In the energy industry, digital twins can be used to simulate and optimize the performance of energy systems, such as power plants or wind farms. By creating a digital twin of an energy system, engineers and operators can run simulations to test the performance of the system under varying conditions, e.g. weather, demand, or supply. This can help identify potential issues before they occur in the physical system, allowing for proactive maintenance and improved system performance.

The benefits of using digital twins and AI for simulations include improved system performance, reduced downtime and maintenance costs, and increased safety and reliability. By using digital twins and AI to simulate and optimize energy systems, energy providers can also reduce their environmental impact by optimizing energy efficiency and reducing waste.

Other common AI use cases in energy include:

- Demand forecasting
- Efficient energy storage
- Front-end engineering and design (FEED) automation
- Inventory management
- Logistic optimization
- Market pricing
- New-material discovery
- Predictive maintenance
- Production optimization
- Security
- Smart grids and microgrids
- Storage efficiency
- Usage forecasting

Finance

Finance organizations have been applying machine learning to surface insights, make critical decisions more quickly, and automate high-volume, manual tasks associated with trading in public markets.

Traders are bullish on AI. In a JPMorgan Chase & Co. survey published in February 2023, **traders shared how AI and machine learning models will have the largest impact** on financial markets in the years to come. More than half of 835 respondents (institutional and professional traders) expect AI to have a significant impact on trading over the next three years. That's up from about 25% in 2022.

Common AI use cases in finance include:

Contract processing: Natural language processing (NLP) is used in the finance industry for processing contracts. Applying NLP models to read and parse contracts can significantly reduce hours of redundant labor. For example, JPMorgan developed such a text-mining solution they refer to as COIN (Contract Intelligence). COIN helps analyze commercial loan contracts by parsing the document for certain words and phrases, saving the company 360,000 hours per year.

Customer communications: Applying NLP models to customer communications on social media, phone transcripts, and customer service chat platforms allows financial institutions to categorize customer feedback and gauge sentiment to better understand their customers. AI provides the ability to analyze comments for sentiments that signal intentions, identify patterns to suggest areas for improvement, or flag issues before they affect a large number of customers.

Advanced analytics: Hedge funds have invested heavily in machine learning and other advanced analytic techniques, as they are constantly searching for new sources of information to make better trading decisions. Powerful quantitative models serve as core pillars of the hedge business and it's no surprise that funds are early adopters of deep learning.

With so much money at stake, hedge funds are increasingly turning to "alternative data" to generate leading indicators of market trends. For example, they can input satellite images into GPU-accelerated neural networks that will estimate everything from the number of ships in a port to the amount of crops growing in a field. By using deep learning techniques to generate higher-quality inputs, they can improve the outputs of their existing quantitative models.

Other common AI use cases in finance include:

- Rate-of-return analysis
- Portfolio management
- Market and trading risk
- Market price simulation

Government

Public agencies have an advantage over organizations in the private sector: a remarkable collection of data with high accuracy and a mandate to use it to provide better services to citizens. The primary challenge government agencies face in applying AI is keeping data secure. Some data is protected by law, such as individuals' health and finance information. Nations and states must keep infrastructure and military data secure from exposures and risks that can be associated with AI solutions deployed at scale.

Multi-cloud strategies and security in the software development process (DevSecOps) and AI are **challenges that governments are facing** today, according to a survey of business and IT leaders by Market Connections and Science Applications International Corporation (SAIC), in a report published in January 2023.

Common AI use cases in government include:

Emergency response: The capability to incorporate data from multiple sources gives a significant advantage to local governments and authorities in their emergency response capabilities. Real-time analytics help support immediate decisions in stressful situations. Control over multiple communication channels, use of smart tools that recognize possible threats, and the ability to send alarms give local authorities the chance to warn citizens and advise them about further actions.

Other common AI use cases in government include:

- At-risk population support
- Benefits administration
- Climate analysis
- Criminal detection
- Digital transformation
- Economic analysis
- Equipment monitoring
- Fraud detection
- Health predictions
- Military support
- Personnel readiness
- Security threats
- Services modernization
- Trade surveillance
- Weapons innovation

Healthcare

Healthcare has been forever changed by the introduction of AI applications that can identify medical issues faster, and often with greater accuracy, than people can. AI-assisted technologies are making it possible to improve diagnostic, descriptive, prescriptive, and predictive analytics to forecast individuals' diagnostic outcomes.

AI adoption could lead to savings between 5% and 10%, an **annual savings of $200 billion to $360 billion**, according to researchers from Harvard and McKinsey in a January 2023 paper. The estimates take into consideration AI use cases for current technologies that will be available in the next five years.

Common AI use cases in healthcare include:

Disease detection and diagnosis: Visual data processing helps radiologists read images faster for diagnoses, e.g. tumor detection. Radiologists' workloads have increased significantly in recent years. Some studies have found that the average radiologist must interpret an image every 3-4 seconds to meet demand.

Researchers have developed deep learning algorithms trained on previously captured radiographic images to recognize the early development of tumors in the lungs, breasts, brain, and other areas. Algorithms can be trained to recognize complex patterns in radiographic imaging data.

One early breast cancer detection tool developed by the Houston Methodist Research Institute interprets mammograms with 99% accuracy and decreases the need for biopsies. It also provides diagnostic information 30 times faster than a human. This leads to better patient care and helps radiologists be better at their jobs.

AI is also used for skin cancer diagnosis. Several researchers have used convolutional neural networks (CNNs) to develop machine learning models for skin cancer detection with 87-95% accuracy using TensorFlow, scikit-learn, Keras, and other open-source tools. In comparison, dermatologists have a 65% to 85% accuracy rate in detecting melanomas. In addition to skin cancer diagnosis, researchers are also using CNNs to develop tools for diagnosing tuberculosis, heart disease, Alzheimer's disease, and other illnesses.

Other common AI use cases in healthcare include:

- Care delivery
- Chronic care management
- Clinical decision support
- Data management
- Digital pathology
- Disease forecasting
- Disease research and treatment
- Drug development
- Emergency dispatch optimization
- Genetic medicine
- Healthcare equity improvements
- Medical imaging analysis
- Patient self-care and wellness
- Telemedicine capabilities

Insurance

The insurance industry has a long quantitative tradition; however, this heavily regulated, risk-averse field has not had the same focus on data science and machine learning as sister industries banking and finance. Yet, insurance organizations have been shifting from a piecemeal approach to technology, transforming system by system, to initiatives led by line-of-business and department heads who are collaborating with chief information officers (CIOs) and chief technology officers (CTOs).

In its **2023 Insurance Outlook**, the Deloitte Center for Financial Services urges insurance organizations to focus technology strategies and investments on differentiating insurers in customer segmentation, product support, and value-added services.

Common AI use cases in insurance include:

Underwriting assessments: The condition of a home's roof is critical to accurately pricing coverage. Traditionally, many insurance companies rely on homeowner-reported roof age to assess roof condition, an approach that is obviously subject to error. But with deep learning, insurance companies can use photographs of a roof to create a deep learning model that will provide a much more accurate representation of the roof's quality. This enables insurance companies to reduce home insurance risk.

Claims adjustment: Insurance companies also are using image classification techniques to make the work of insurance adjusters faster and more accurate. Rather than relying on an insurance adjuster to read the odometer of a car that has been in an accident, a deep learning model can ingest a photograph of the odometer and determine the correct reading.

Again, it's important to note that these companies are not throwing away their existing models in favor of entirely new approaches. Instead, they are leveraging new AI techniques to improve the inputs to their models.

Other common AI use cases in insurance include:

- Rate-of-return analysis
- Portfolio management
- Market and trading risk
- Market price simulation

Manufacturing

For years, leaders in manufacturing have been applying machine learning to optimize safety, product quality, and large-scale delivery of goods. Opportunities to apply AI in manufacturing are seemingly countless, because the industry relies heavily on both hardware and software to deliver products.

Edge AI, which relies on sensors in the field to deliver data to platforms that organize and analyze data, is a common use case in manufacturing. This is also referred to as IoT, or the Internet of Things. Industry experts have touted another approach, called adaptive AI, as key to **navigating data challenges in the cloud and on the edge.**

Top AI use cases in manufacturing have focused on predictive models to forecast critical factors related to supply chain, maintenance, logistics, and inventory, among other areas. AI can deliver outsized benefits, and for manufacturers, that can mean lower costs, faster delivery, and higher quality.

Common AI use cases in manufacturing include:

Quality control: Image recognition and anomaly detection are types of machine learning algorithms that can quickly detect and eliminate faulty parts before they get into the vehicle manufacturing workflow. Parts manufacturers can capture images of each component as it comes off the assembly line, and automatically run those images through a machine learning model to identify any flaws.

Highly accurate anomaly detection algorithms can detect issues down to a fraction of a millimeter. Predictive analytics can be used to evaluate whether a flawed part can be reworked or needs to be scrapped. Eliminating or re-working faulty parts at this point is far less costly than discovering and having to fix them later. It saves on more expensive issues down the line in manufacturing and reduces the risk of costly recalls. It also helps ensure customer safety, satisfaction, and retention.

Supply chain optimization: Throughout the supply chain, analytical models are used to identify demand levels for different marketing strategies, sale prices, locations, and many other data points. Ultimately, this predictive analysis dictates the inventory levels needed at different facilities. Data scientists constantly test different scenarios to ensure ideal inventory levels and improve brand reputation while minimizing unnecessary holding costs.

Optimization models help guide the exact flow of inventory from manufacturer to distribution centers and ultimately to customer-facing storefronts. Machine learning is helping parts and vehicle manufacturers and their logistics partners operate more efficiently and profitably, while enhancing customer experience and brand reputation.

Other common AI use cases in manufacturing include:

- Digital twins (simulations)
- Edge AI
- Energy management
- Generative design
- Inventory management
- Just-in-time logistics
- Market analysis
- Predictive maintenance
- Predictive yield
- Price forecasting
- Process optimization
- Production optimization
- Quality assurance
- Robotics
- Root-cause analysis

Retail

The retail industry has taken its share of hits in the last few years, with the COVID-19 pandemic forcing retailers to shutter their doors and adapt to contactless shopping, service, and delivery. Those that were able to adapt quickly took retail to new heights of customer-focused service that, for many brands, strengthened their relationships with customers.

Big-box retailers Target and Walmart rolled out drive-up delivery and buy-online-pick-up-in-store (BOPIS) services, and some retailers, like Lowe's Home Improvement, did it in a hurry to meet customer demand when the pandemic forced closures. Then came Russia's war on Ukraine, and along with it, supply chain challenges that squeezed retailers' ability to stock inventory and thus their bottom lines.

AI provides incredible opportunities for retailers, among them: a deeper understanding of their customers and the personalization capabilities to **engage their most valuable customers.**

Common AI use cases in retail include:

Customized services: Olay, the multi-billion dollar skin care brand, launched a "Skin Advisor" application using neural networks in 2016 and **doubled its sales conversion rates.** Prospective customers submit a photograph, and the model returns a customized skin assessment and suggests corrective products for the customer to purchase.

While this might seem like a novelty product, it has had a significant financial impact. As a result of the application, average basket sizes, or the amount of goods a customer purchases at one time, went up 40% and conversion rates doubled. By harnessing AI, Olay offers a personalized shopping experience and customers are responding by buying more products.

Other common AI use cases in retail include:

- Customer segmentation
- Demand forecasting
- Delivery scheduling and route optimization
- Inventory optimization
- Planogram creation
- Supply chain optimization
- Workforce scheduling and management

As these examples have shown, AI saves the enterprise money and time. It helps mitigate risk, supports smarter marketing and business decisions based on insights derived from data analysis, drives customer retention and growth, and generates profit. As AI technology continues to develop and become more sophisticated, businesses must look to invest in AI in order to gain a competitive edge.

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